Answers of Questions in lesson 6-1 Alg 2

7. **CCSS MODELING** Dora has 8% of her earnings deducted from her paycheck for a college savings plan. She can choose to take the deduction either before taxes are withheld*,* which reduces her taxable income*,* or after taxes are withheld. Dora*’*s tax rate is 17.5%. If her pay before taxes and deductions is $950*,* will she save more money if the deductions are taken before or after taxes are withheld? Explain.

*SOLUTION:*

Either way*,* she will have $228.95 taken from her paycheck. If she takes the college savings plan deduction before taxes*,* $76 will go to her college plan and $152.95 will go to taxes. If she takes the college savings plan deduction after taxes*,* only $62.70 will go to her college plan and $166.25 will go to taxes.

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|  | |  | | --- | | **FINANCE** A ceramics store manufactures and sells coffee mugs. The revenue *r*(*x*) from the sale of *x* coffee mugs is given by *r*(*x*) = 6.5*x*. Suppose the function for the cost of manufacturing *x* coffee mugs is *c*(*x*) = 0.75*x* + 1850.    **a.** Write the profit function.    **b.** Find the profit on 500, 1000, and 5000 coffee mugs. | |  |

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|  | **SOLUTION:** |
|  | |  | | --- | | **a.** The profit function *P*(*x*) is given by http://esolutions.mcgraw-hill.com/GetCogneroMedia.ashx?id=30%3ay%1D%1C%0B%09%0AW%07K%1CD where *r*(*x*) is the revenue function and *c*(*x*) is the cost function.  So:  http://esolutions.mcgraw-hill.com/GetCogneroMedia.ashx?id=30%3ay%1D%1C%0B%09%0AW%07K%1DM    **b.**  http://esolutions.mcgraw-hill.com/GetCogneroMedia.ashx?id=30%3ay%1D%1C%0B%09%0AW%07K%1DL  http://esolutions.mcgraw-hill.com/GetCogneroMedia.ashx?id=30%3ay%1D%1C%0B%09%0AW%07K%1DC  http://esolutions.mcgraw-hill.com/GetCogneroMedia.ashx?id=30%3ay%1D%1C%0B%09%0AW%07K%1DB | |

**Q49**

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| |  | | --- | | **If *f*(*x*) = 5*x,* *g*(*x*) = –2*x* + 1*,* and *h*(*x*) = *x*2 + 6*x* + 8*,* find each value.** | |  |
| http://esolutions.mcgraw-hill.com/GetCogneroMedia.ashx?id=13%3a%5B%00%5D%0AJ%1C%04%02P%13%06 | |  | | --- | |  | |  |

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|  | **SOLUTION:** |
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**Q60**

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| |  | | --- | | **CCSS CRITIQUE**Chris and Tobias are finding the composition http://esolutions.mcgraw-hill.com/GetCogneroMedia.ashx?id=60%3a%1DP%0C%0C%0AJe%7FT%5C%60*,* where *f*(*x*) = *x*2 + 2*x* – 8 and *g*(*x*) = *x*2 + 8. Is either of them correct? Explain your reasoning.    http://esolutions.mcgraw-hill.com/GetCogneroMedia.ashx?id=15%3AI%2502J%251C%250B%2507T%2511%2505%2507B | |  |

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|  | **SOLUTION:** |
|  | |  | | --- | | Tobias is correct. Chris did not substitute *g*(*x*) for every *x* in *f*(*x*). | |

**Q62**

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| |  | | --- | | **REASONING** State whether each statement is sometimes*,* always*,* or never true. Explain your reasoning.    **a.** The domain of two functions *f*(*x*) and *g*(*x*) that are composed *g*[*f*(*x*)] is restricted by the domain of *f*(*x*).    **b.** The domain of two functions *f*(*x*) and *g*(*x*) that are composed *g*[*f*(*x*)] is restricted by the domain of *g*(*x*). | |  |

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|  | **SOLUTION:** |
|  | |  | | --- | | **a.** Always; since the range is dependent on the domain, the domain of *g*[*f*(*x*)] is restricted by the domain of *f*(*x*).    **b.** Sometimes; when *f*(*x*) = 4*x* and *g*(*x*) = http://esolutions.mcgraw-hill.com/GetCogneroMedia.ashx?id=24%3A%251DC%2509%255BL%2502c%251E%2511%2502%2509, *g*[*f*(*x*)] = http://esolutions.mcgraw-hill.com/GetCogneroMedia.ashx?id=6%3AB%2514%250B%2509IeXD%2505T%250B. The domain of *g*(*x*) restricts the domain of *g*[*f*(*x*)]. When *f*(*x*) = 4*x*2 and *g*(*x*) = http://esolutions.mcgraw-hill.com/GetCogneroMedia.ashx?id=24%3A%251DC%2509%255BL%2502c%251E%2511%2502%2509, *g*[*f*(*x*)] = http://esolutions.mcgraw-hill.com/GetCogneroMedia.ashx?id=38%3AT%251CM%2509%2514Bdw%2518%2515%2505. In this case, the domain of *g*(*x*) does not restrict the domain of *g*[*f*(*x*)]. | |